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The Efficacy of an Educational Intervention to Improve Low Influenza Vaccination Rates Among Federal Health Care Workers

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This doctoral project, directed and approved by the candidate's committee, has been accepted by the College of Graduate and Professional Studies of Abilene Christian University in partial fulfillment of the requirements for the degree

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The Efficacy of an Educational Intervention to Improve Seasonal Influenza Vaccination Rates Among Federal Health Care Workers

A doctoral project submitted in partial satisfaction

of the requirements for the degree of

Doctor of Nursing Practice

by

Cynthia Berfect-Shelby

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Acknowledgments

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Abstract

Influenza is a preventable communicable illness that has a significant impact on people of all ages. In 2018 it was estimated that 80,000 people died of influenza-related illnesses. Infants and elderly people are among the most vulnerable populations. The Centers for Disease Control and Prevention and Healthy People 2020 recommend that health care facilities have a 90% vaccination rate. Despite the recommendations and a mandatory directive, many facilities within the Veterans Health Administration struggle to reach influenza vaccination rates above 60%. Pender's health promotion model was used as the theoretical framework to explore the reasons why health care workers refuse the vaccine and whether an influenza educational intervention would increase willingness to accept the vaccine. To study this phenomenon, the researcher used a one-group pretest-posttest design and purposive sampling to recruit 64 unvaccinated health care workers at a Veterans Health Administration facility in the southeastern United States. Participants voluntarily enrolled in the study and completed a demographic profile and influenza pretest questionnaire. After a 15-minute educational intervention, participants completed an influenza posttest questionnaire. Results showed that a 15-minute educational presentation about influenza was effective in enhancing knowledge about goals for influenza vaccination among federal health care workers and willingness of unvaccinated federal employees to receive a flu vaccination. Among the 64 participants, knowledge of the Healthy People 2020 and The Joint Commission goal of reaching a 90% vaccination rate by 2020 increased from 54.7% to 87.5%. Participants' willingness to receive the vaccination increased from 47.5% to 65.6%. Both were statistically significant improvements. Awareness of VHA Directive 1192 increased marginally, from 89.1% at pretest to 96.9% at posttest.

Keywords: health care workers, influenza prevention, declination programs, hospital employees, mandates

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Chapter 1: Introduction

Influenza is a preventable contagious respiratory illness that can be prevented with the administration of the influenza vaccination (Grohskopf et al., 2016). Influenza is a viral disease process linked to increased rates of morbidity and mortality (Lavela, Etingen, & Miskevics, 2015). The Centers for Disease Control and Prevention (CDC) reported a rise in flu activity in the United States between 2017 and 2018 as well as a 7.7% increase in influenza-related incidents and hospitalizations, which was higher than during the 2009 influenza A strain (H1N1) pandemic (Grohskopf et al., 2018).

According to Grohskopf et al. (2018), the 2018 year was a deadly influenza season, with a total of 181 pediatric deaths reported for 2017–2018. Overall, it is estimated that 80,000 people died from influenza-related illnesses in 2018. Data from the CDC (2018) confirmed 29,269 influenza-related hospitalizations between October 2017 and April 2018 and a hospitalization rate of 103.7 per population of 100,000. Hospitalization rates among the most vulnerable adults age 65 and older were 446.4 per population of 100,000, followed by adults ages 50 to 64 with a rate of 112.8 per population of 100,000. Children from infancy to age 4 years had a hospitalization rate of 72.7 per population of 100,000. Most hospitalizations were related to influenza A (21,865 cases or 73.8%), followed by influenza B with 7,565 (25.5%) cases. There were 105 (0.4%) cases with coinfections of both influenza A and B, and 94 (0.3%) with an undermined type of influenza. Individuals with other comorbidities such as cardiovascular disease, metabolic syndrome, and chronic lung disease represented over 4,230 cases who were hospitalized with at least one of the previously mentioned comorbidities; cardiovascular disease was the leading underlying condition.

Recommendations by the Advisory Committee for Immunization Practices (ACIP) indicated that individuals 6 months or older should take the flu vaccine (Grohskopf et al., 2013).

The ACIP emphasized the importance of vaccinating individuals who reside with or care for individuals who are considered at high risk for influenza related complications. Furthermore, the CDC highly recommended receipt of annual influenza vaccinations for all health care workers (HCWs) and individuals in training for health care professions. The ACIP indicated that personnel in health care settings should be vaccinated, including physicians, nurses, and other HCWs in both inpatient and outpatient settings. First responders such as emergency medical technicians and paramedics should also be included. Additionally, HCWs in long-term care facilities and nursing homes who provide direct contact patient care should be vaccinated.

Unfortunately, influenza can cause a significant financial burden on health care facilities due to lost time from work and lost wages. Employee absenteeism affects health care facilities' productivity as well as the economy. According to Walgreens (2013), influenza cost employers $10 billion between 2010 and 2011 and $30.4 billion between 2012 and 2013. Flu also causes a huge financial burden on employees. The Walgreens survey indicated that employees lost $8.5 billion in wages during a single year.

According to Grohskopf et al. (2013), it is estimated that $10.4 billion is spent on both direct and indirect costs on influenza and influenza-related illnesses in the United States annually. An estimated $16.3 billion in lost wages is incurred annually as a direct result of influenza and influenza-related illnesses. The CDC estimated $87 billion as the overall economic burden of influenza and influenza-related illnesses. Young-Xu, van Aalst, Russo, Lee, and Chit (2017) used statistics from the Bureau of Labor Statistics and the Department of Veterans Affairs (VA) managerial cost system to study the annual burden influenza has on the US VA population from 2010 to 2014. The results of the 5-year study revealed an estimated 10,674 VA emergency room visits, 2,538 hospitalizations, 5,522 deaths, and 3,793 underlying respiratory and circulatory related deaths both within and outside of the VA related to influenza

and influenza-related illnesses. Additionally, the findings indicated that the VA lost $27 million in time from work and productivity in addition to spending $6.6 million on emergency room visits.

Alarmingly, over 96% of VA hospitalizations for influenza resulted in a patient dying or being discharged to home with an overall annual cost of $36 million (Young-Xu et al., 2017). According to Young-Xu et al. (2017), of the remaining 4%, patients were either sent to an extended care facility or skilled nursing home. Moreover, hospitalizations for influenza-related illness cost over $5.5 million annually. The overall economic burden of influenza in the Veterans Health Administration (VHA) is an estimated $1.2 billion, with premature deaths costing the most followed by hospitalizations.

Jackson-Lee, Barr, and Randall (2016) asserted that influenza and flu epidemics were responsible for overwhelming health care facilities across the nation and contributing to HCW absenteeism and decreased productivity due to illness. Despite astounding statistics on the morbidity and mortality of influenza, vaccination rates in the veterans health care system remain lower than the national goal of 90% (Razouki et al., 2016). There is paucity in the literature regarding effective educational strategies that compel HCWs to commit to receiving annual influenza vaccinations.

Problem of Interest

Influenza vaccination rates among federal HCWs are alarmingly low, with vaccination rates below 60% for many VA health care facilities, which is below that of private health care facilities and Healthy People 2020 recommendations because vaccination was not required prior to September 2017 (U.S. Department of Health and Human Services, 2012). Sadly, many unvaccinated HCWs provide direct care to sick patients, which increases their risk of exposure. Low influenza vaccination rates among federal HCWs increase the risk of transmitting this

communicable illness to vulnerable populations. Low vaccination rates also place a significant financial burden on federal health care systems. As vaccination rates continued to plummet, the VHA implemented a mandate: HCWs must receive the vaccination or wear a mask. This directive was implemented nationally during the 2017 flu season. Prior to the implementation of the flu directive, employees were given an option to get vaccinated. However, despite the implementation of the mandate, flu vaccination rates remain substandard.

Background

The vaccination rates in the VHA have consistently remained lower than that of private facilities and national standards. Although various strategies were developed to promote employees receiving the vaccine, the facilities' influenza vaccination rate remains between 40% and 60%, which is significantly lower than The Joint Commission (2012) standard of 90%. This project was designed to address a preventable disease process that results in increased morbidity and mortality for people of all age groups, especially young children and the elderly. In fact, increased flu activity has been reported all over the United States, as well as a 7.7% increase in influenza-related incidents and hospitalizations, which is higher than reported during the H1N1 pandemic in 2009 (Grohskopf et al., 2018). According to the Grohskopf et al. (2018), 2017 was a deadly season, with an estimated 167 pediatric deaths.

On September 26, 2017, the VHA developed an influenza policy to decrease the transmission of influenza. VHA Directive 1192, Seasonal Influenza Preventive Program, was designed to help the VHA achieve the U.S. Department of Health and Human Services' (2012) Healthy People 2020 recommendations and The Joint Commission (2012) standards of 90% for the annual vaccination rate for HCWs. The directive specified that HCWs who are unwilling to get vaccinated must wear a face mask throughout flu season. Although the VHA directive has been implemented with multiple vaccination campaign efforts such as kick-off events, extended

clinic hours, and mobile flu clinics, the vaccination rate for the Southeast Louisiana Veterans Health Care System (SLVHCS) remains less than 60%. In this investigator's current job, many HCWs are reluctant to receive the annual flu vaccine, though doing so is voluntary and free of charge.

VHA Directive 1192 stated that medical facilities are required to increase the flu vaccination rates for HCWs to 90% by the year 2020. The directive outlined the seasonal influenza policy and stated that HCWs are expected to receive an annual influenza vaccination (Department of Veterans Affairs, 2017). Those who refuse to receive the vaccine are required to wear a face mask while on duty during flu season. The VA is a unionized facility. Therefore, facility leaders must comply with union contractual agreements. Union presidents argue that employees cannot be forced to get a flu vaccine or wear a mask as a condition of employment for refusal. Hence, there are no true consequences for refusing the vaccine. Union guidelines also stipulate that the occupational health staff cannot report employees based on their vaccination status or notify the employees supervisor unless the employee signs a release of information. The aforementioned guidelines pose a significant barrier to reaching the standards.

Patients are the major stakeholder in this situation. The VA serves military veterans who have fought to protect the freedoms and liberties of all United States citizens. Without them, federal HCWs would not exist. Federal HCWs are obligated to provide the highest quality of safe and effective care to veterans. Conversely, it does a disservice to veterans to expose them to unvaccinated HCWs, as such personnel can potentially transmit influenza to patients who they are obligated to serve.

HCWs are employed in at various VHA locations provide direct contact with patients while on duty. VHA locations include VA hospitals, outpatient clinics, short- and long-term care facilities, community-based outpatient clinics (CBOCs), veterans centers, and facilities leased for

veteran care. HCWs in VA include both full- and part-time administrative and clinical staff, licensed and unlicensed personnel, VA licensed and unlicensed, fee-based and contract HCWs, researchers, students, trainees, and volunteers who provide veteran services.

SWOT Analysis

A strengths, weaknesses, opportunities, threats (SWOT) analysis was performed to determine issues at SLVHCS that could contribute to low vaccination rates among HCWS. The facility's strengths, weaknesses, opportunities, and threats related to the influenza vaccination program were evaluated. Noteworthy weaknesses identified in the SWOT analysis that could be viewed as hinderances to employees getting vaccinated were as follows: decreased morale and motivation, over 48% of staff members being unvaccinated, loss of wages for lost time from work due to flu-like illnesses, lack of an effective flu vaccination interdisciplinary team, union opposition to mandatory vaccines, and no consequences for refusing the flu vaccine.

External and internal factors also were evaluated within the SWOT analysis. The community, which includes family members of veterans, was identified as an external factor because they are at risk of contracting influenza if they encounter unvaccinated HCWs. Private and state hospitals and clinics were identified as external factors because these facilities require employees to receive the flu vaccine annually as a condition of employment. Because of strict infection control practices at neighboring facilities, they can meet and exceed the standard of a 90% or greater vaccination rate. This is problematic for the VA from a competitive standpoint as it pertains to facility infection control measures. Low vaccination rates have become a greater issue since the VA began acquiring staff from facilities that have mandatory flu requirements because at the VA they have the option to opt out or decline the vaccine.

From an ethical perspective, health care institutions should hold HCWs accountable and enforce annual influenza vaccinations. Enforcing mandatory vaccination programs holds

professional staff to the oath of beneficence, of first doing no harm. Furthermore, mandatory programs can help promote accountability among health care organizations and staff to prevent the transmission of communicable illness such as influenza.

According to Ottenburg et al. (2011), mandatory flu vaccines fall within the institutional realm, and legally the government has the power to protect public welfare. However, each state has the power to place restrictions on individual liberties as they relate to public health issues that can affect the general population. Because of the burden on the public health system, states should enforce mandatory vaccines for HCWs. The only exceptions should be documented medical complications or contraindications. Influenza can place a significant financial burden on health care facilities due to lost time from work and lost wages. Employee absenteeism impacts productivity as well as economics for health care facilities. According to Walgreens (2013, influenza cost employers $10 billion between 2010 and 2011 and $30.4 billion between 2012 and 2013. Flu also places a huge financial burden on employees. Walgreens indicated that employees lost $8.5 billion in wages.

Finally, influenza is contagious viral respiratory illness that can be prevented with the flu vaccine. Annually, many people die from this preventable disease process. Unfortunately, unvaccinated federal HCWs contribute to the transmission of flu in various health care settings. Despite strong recommendations by health care organizations, vaccination rates remain below the target of 90% within federal health care facilities across the nation, as outlined by Healthy People 2020 (U.S. Department of Health and Human Services, 2012). Influenza places a significant burden on the public health department, health care facilities, and employees due to lost wages and decreased productivity. The researcher chose this project to address this important clinical issue, which results in increased morbidity and mortality for people of all age groups, especially young children and the elderly. Ultimately, the goal is to increase HCWs'

knowledge of influenza transmission and prevention and to increase SLVHCS vaccination rates to meet The Joint Commission (2012) and Healthy People 2020 (U.S. Department of Health and Human Services, 2012) goals by utilizing a comprehensive seasonal influenza plan.

Purpose of Project

The purpose of this project was to assess the efficacy of an educational intervention among federal HCWs who decline the flu vaccine. For this study, efficacy was measured by willingness to receive / acceptance of future flu vaccines. The goal of this study was to increase knowledge of influenza prevention by educating HCWs on how to prevent the spread of influenza and increase their willingness to accept the vaccine. Long-term goals are to increase influenza vaccination rates among HCWs to meet The Joint Commission (2012) standard and Healthy People 2020 goal (U.S. Department of Health and Human Services, 2012) by utilizing a comprehensive seasonal influenza plan. Secondary goals include requiring biannual educational webinars on influenza for all HCWs. The desired effect is for these measures to aid in incrementally increasing HCWs influenza vaccination rates by at least 30% each year.

Project Significance

This project will help federal health care facilities and HCWs develop effective educational interventions and strategies to increase HCWs' knowledge of influenza prevention strategies and willingness to accept future vaccines. It is crucial that HCWs realize the importance of getting vaccinated to prevent the spread of a treatable disease process and nosocomial outbreaks to veteran patients, staff, families, visitors, and the community. Pica and Bouvier (2012) contended that viral respiratory illnesses such as influenza are ubiquitous as well as burdensome; they account for millions of dollars in lost time from school, work, and hospital visits. Influenza is a preventable communicable illness spread by various modes. According to the CDC (2010), the modes of transmission for viral respiratory illnesses are as follows:

1. Contact transmission, which involves touching or direct contact; the virus can be spread when the mucous membranes encounter soiled hands.
2. Direct transmission, in which the virus is transferred by contact with an infected person to another person without a contaminated object, known as a fomite.
3. Indirect transmission, in which contact with contaminated intermediate objects can also transfer the virus.
4. Droplet spray transmission, in which the virus can be spread through airborne droplets, such as when coughing or sneezing, transferring the virus as the droplets are deposited on mucous membranes.
5. Aerosol transmission, in which the virus is spread through the air by aerosols and the inhalation of small particles into the oral nasopharynx as well as the trachea and lungs.

Health promotion and disease prevention are the cornerstones of the nurse practitioner role with a focus on disease prevention and health care maintenance (Thomas, Hart, & Burman, 2014). In this investigator's current practice, many HCWs are reluctant to receive the annual flu vaccine. Receipt of the vaccine is voluntary and free of charge. Despite various strategies to promote receiving the vaccine, the facility's influenza vaccination rate remains between 40% and 60%, which is significantly lower than The Joint Commission (2012) standard of 90%. Pender's (1996) health promotion model (PHPM) was utilized as the theoretical framework to address this phenomenon. The evidence to support the use of this model is lack of preventive health-promoting practices among HCWs as evidenced by the group's low vaccination rates. This investigator used Pender's model to assess the health-promoting practices of HCWs by determining if one's willingness to accept future influenza vaccinations after an influenza educational intervention changed.

Nature of the Project

The research design for this project was a one-group pretest-posttest design. This type of design is used commonly and is categorized as quasi-experimental. The design was selected because purposive sampling was used to acquire participants. Participants in this study were limited to employees who did not receive the flu vaccine.

According to the U.S. Department of Health and Human Services (HHS, 2012) Healthy People 2020 and The Joint Commission (2012) standards, the goal for influenza vaccination rates for HCWs is 90%. The HHS program was designed to reduce, eliminate, or maintain the reduction of diseases that could be prevented with vaccinations. To meet the goal of preventing influenza, HHS recommended increasing the percentage of vaccinated HCWs annually. Although many diseases are preventable with vaccines, infectious diseases such as influenza remain a leading cause of illness, disability, and death. Hence, strong influenza vaccination programs, especially among HCWs, will help reduce the transmission of communicable diseases.

Research Question

Q1. Do health-promoting practices affect federal HCWs' willingness to get vaccinated against influenza after receiving a 15-minute educational intervention on prevention strategies and knowledge of influenza transmission during future flu seasons?

PICO Final Statement

- PICOT: Does willingness to accept the influenza vaccinations among federal HCWs (P) increase after receiving a 15-minute educational intervention (I) on prevention strategies and knowledge of influenza transmission during future flu seasons (T)?
- Independent variable: Receipt of a 15-minute educational intervention.
- Dependent variable: Acceptance of the vaccine and receipt of flu vaccination.

- Population/problem: HCWs who are reluctant to get vaccinated against influenza in the VA health care system.
- Intervention: Presenting a 15-minute educational intervention to unvaccinated HCWs to assess their willingness to engage in influenza prevention by promoting vaccine acceptance among federal HCWs. Participants completed an influenza pretest and posttest to determine reasons for declining the vaccine and if future acceptance of the vaccine would change after the educational intervention.
- Comparison: Comparing willingness to receive and acceptance of the flu vaccine before and after the educational intervention.
- Outcome: The desired outcome was to increase HCWs' knowledge of influenza prevention strategies and willingness to accept future vaccinations.
- Time: The educational intervention was performed for 2 months. The interventions had to be performed outside of the principal investigator's daytime work schedule due to facility stipulations with collecting data for school projects. Data collection was limited to lunch breaks during the daytime. After the investigator's tour of duty, data collection was conducted on evening and night shifts. Presentations were limited to individuals and small groups due to privacy issues surrounding employees' flu vaccination status.

Definition of Terms

For the purpose of this project, the following definitions were used to clarify the key terms utilized throughout this project:

Declination. Declination is the refusal or reluctance to receive the flu vaccine.

Health care workers (HCWs). HCWs include registered nurses, advanced practice registered nurses (APRNs), licensed practical nurses, nursing assistants, and health technicians.

Health promoting behavior or practices. These behaviors and practices include actions directed toward sustaining or increasing an individual's level of understanding of well-being.

Vaccine. A vaccine is "a product that stimulates one's immune system to produce immunity to a specific disease, protecting the person from diseases that can be administered via needle injections or sprayed into the nose" (CDC, 2017).

Willingness to receive or acceptance of the vaccine. Willingness is defined as voluntary acceptance of the influenza vaccine.

Scope of Project

The project involved federal HCWs employed at a veterans health care facility in the southeastern United States who were 18 years of age or older. The educational training and completion of the questionnaire were administered over the course of 2 months. Participants who were included in this project met the following criteria:

1. Federal HCWs 18 years of age and older who provide direct patient care.
2. Ability to read, write, and comprehend the English language.

Project exclusions were as follows:

1. Individuals who work in the federal health care facility who do not provide direct patient care. Rationale: HCWs who provide direct patient care are at an increased risk of contracting influenza.
2. Individuals who have received the influenza vaccine. Rationale: The goal of this project was to encourage unvaccinated staff to get vaccinated.
3. Contract workers. Rationale: Vaccines are offered to contract workers free of charge, even though they are not staff HCWs.
4. Volunteers. Rationale: Vaccines are administered to volunteers free of charge, but they do not provide direct patient care.

Summary

This chapter provides a general overview of influenza as well as the effects of low vaccination rates among federal HCWs who provide direct patient care and decline the flu vaccine. Influenza is a contagious, vaccine-preventable respiratory illness that is spread by airborne droplets and on surfaces. The Advisory Committee for Immunization Practices indicated that individuals aged 6 months or older should receive the influenza vaccine. The ACIP highly recommended receipt of annual influenza vaccinations for all HCWs and individuals in training for health care professions (Grohskopf et al., 2013).

Despite the ACIP recommendations, influenza morbidity and mortality rates, as well as the disease's economic burden, continue to rise in part due to poor vaccination rates among HCWs. To address this alarming health care issue, the U.S. Department of Health and Human Services' (2012) Healthy People 2020 and The Joint Commission (2012) recommended a 90% vaccination rate for HCWs. The HHS's goal is to decrease the transmission of preventable illnesses, decrease morbidity, and reduce mortality. In this project, the researcher strove to reveal the effects of an educational intervention on increasing HCWs' knowledge of influenza prevention strategies and willingness to accept future vaccinations.

Theoretical Framework

Pender's (1996) health promotion model served as the theoretical foundation for this project. Pender's model evolved from the health promotion model (HPM) developed by Rosenstock in 1960. Development of this model was proposed as an extension of the original health belief model to explain the subjective aspects of health-related behaviors. The original health belief model is a valuable tool utilized to describe the reasons why some individuals actively avoid illness and others do not. It also identifies people who will use preventive practices. The model demonstrates that interventions may increase participation in preventive

behaviors (Redman, 1993). The goal of the HPM model is to help people improve their well-being with self-initiated changes in behavior. The HPM was designed to introduce concepts that explain the occurrence of health-promoting behavior, generate hypotheses that can be tested empirically, and integrate research findings in a logical pattern (see Figure 1).

Pender's (1996) health promotion model was selected as the theoretical framework for this study because it focuses on health-promoting practices of individuals as well as self-initiated actions and perceptions that aid in health maintenance and wellness. The HPM is relevant to nursing because general nursing is a discipline committed to health promotion of individuals throughout the life span. Hence, it is also relevant to nursing because it provides an organizational framework for identifying and explaining relationships, as well as hypothesizing factors that affect decision-making, performance, and outcomes of health-promoting lifestyles (Simmons, 1990).

Pender's (1996) health promotion model uses an approach that focuses on moving toward positive health and well-being. Because health promotion is directed toward one's well-being and self-efficacy, the researcher utilized the framework to improve health-promoting practices among HCWs and facilitate increasing the flu vaccination rate. Lastly, the overall goal of this research was to create an environment that encourages HCWs to choose health behaviors that promote well-being and reduce the incidence of preventable diseases.

Pender's (1996) health promotion model was also used to study myocardial infarction (MI) patients in Turkey. The study evaluated the effectiveness of the HPM and counseling in terms of improving post-MI patients' self-efficacy, functional capacity, prognosis, and risk factors. A pretest and posttest quasi-experimental design was used as the methodology. A total of 70 post-MI patients participated in the study with two groups: an experimental group and a control group. The experimental group received individual counseling in addition to care based

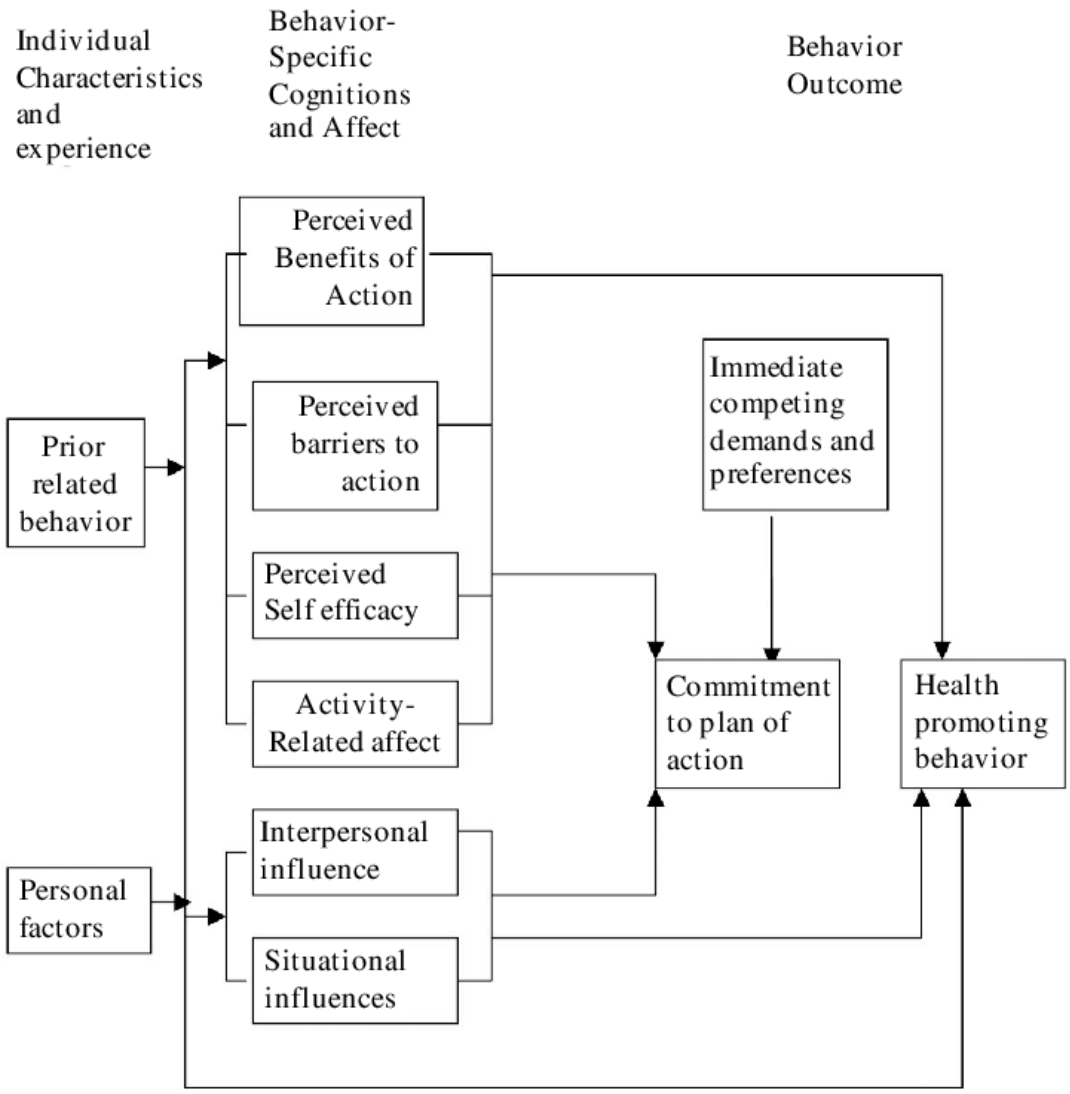

Figure 1. Nola Pender's health promotion model. Reprinted from *Health Promotion in Nursing Practice* (7th ed., p. 40), by N. J. Pender, C. L. Murdaugh, & M. A. Parsons, 2015, New York, NY: Pearson Education, Inc. Copyright 2015 by Pearson Education, Inc. Reprinted with permission.

on the HPM, and the control group received routine care. The researchers concluded that patients in the health promotion intervention arm of the study showed significant improvement in health-promoting practices after 12 weeks in the study (Sevinc & Argon, 2018).

Pender's health promotion model was also used as the theoretical framework to improve nutritional behaviors in overweight and obese women in western Iran (Khodaveisi, Omid, Farokhi, & Soltanian, 2016). In this quasi-experimental study, 108 subjects were selected

through randomization to participate in the study and assigned to either an experimental group or a control group. Participants completed the Health-Promoting Lifestyle Practices (HPLP) II questionnaire, a nutritional behavior questionnaire, and a demographic profile. The researchers concluded that training based on HPLP significantly improved in the experimental group ($p < 0.001$). The findings also validated that health care providers can use the HPLP II questionnaire as an educational model to improve nutritional practices and health promoting behaviors of obese and overweight patients (Khodaveisi et al., 2016).

Kamran, Azadbakht, Sharifirad, Mahaki, and Mobei (2015) conducted a study to determine a relationship between blood pressure and health-promoting practices among patients with hypertension. A cross-sectional design was utilized to study 671 participants who had hypertension and lived in rural areas; participants were randomly selected during different time frames and were required to complete eight sectors of the HPLP II questionnaire. The researchers concluded that participants' health-promoting practices had good predictive value for systolic blood pressure, especially with regard to patients' perception of the diet, perceived benefits, and self-efficacy.

The HPLP II and two other tools were used by researchers to evaluate the health and wellness characteristics of people with traumatic brain injury (TBI) in a VA and rehabilitation facility (Braden et al., 2012). The goal of this study was to describe the health and wellness characteristics of individuals with TBI living in a community compared to other disabled populations and evaluate the association between health-related constructs among the two groups using the HPLP II questionnaire (Braden et al., 2012). This observational study was conducted in both inpatient and outpatient settings. Seventy-four participants were given the HPLP II Self-Rated Abilities Health Practice (SRAHP) scale and Barriers to Health Promoting Activities for Disabled (BHPD) scale. Results of the study indicated the following:

1. Patients with TBI had similar health-promoting behaviors, self-care, and barriers to health as other individuals with disabilities.
2. Participants had a low perception of health and satisfaction with life.
3. Mental health status of participants affected their outlook on self-efficacy and their view of health promotion.
4. Health promotion, perceived mental health, and self-efficacy were negatively associated with barriers to participating in healthy activity. (Braden et al., 2012, p. 1,327)

The researchers concluded that health and wellness in TBI patients were below a desirable level. It was also determined that this cohort needed a better understanding of health-related constructs (Braden et al., 2012).

Chapter 2: Literature Review

The key terms used to conduct an exhaustive review of the literature related to this study and narrow the search for the variables identified in the PICO question for this project were as follows: health care workers, influenza prevention, declination programs, hospital employees, and mandates. Scholarly articles were reviewed to develop an evidence-based approach to developing a comprehensive approach to improving low influenza vaccination rates of federal HCWs. The literature review addressed hospital policies on influenza vaccination rates, factors influencing influenza vaccination rates, and attitudes toward mandatory policies. It also incorporated a review of evidenced-based articles that studied participation in vaccination programs, organizational factors, influenza policies to vaccinate or wear a mask, and influenza prevention campaigns. Review of the literature revealed a lack of research investigating reasons why HCWs decline influenza vaccines and effective influenza educational interventions that promote receipt of the annual vaccine.

Hospital Policies on Influenza Vaccination Rates

Nowalk, Lin, Raymund, Bialor, and Zimmerman (2013) conducted a quantitative study to compare hospitals with mandated influenza vaccines and consequences for noncompliance to facilities that do not have mandates and consequences. A 34-item survey was mailed to 964 hospitals and 433 infection control professionals. The study was conducted in hospitals throughout the United States using a survey developed by the CDC. Out of the facilities surveyed, 150 required annual influenza vaccines. Additionally, 84 had consequences for noncompliance with the mandate to vaccinate or wear a mask: termination, education, direct patient care duty restrictions, or leave without pay. Sixty-six hospitals did not have consequences. The researchers concluded that hospitals with influenza vaccine mandates and consequences had a 19.5% increase in vaccination rates compared to facilities that did not have

mandates and consequences. Although reliability and validity testing regarding the survey tool were not mentioned, the participation of 433 infection control professionals strengthened the study. Despite the significance of the results, the study by Nowalk et al. had limitations. Study limitations included low response rates compared to previous studies utilizing the same survey tool. Norwalk et al.'s study related to the current research project because it demonstrated that consequences for noncompliance result in increased vaccination rates. It demonstrated that enforcement of consequences such as vaccinate or wear a mask, termination, education, restrictions on direct patient care, and leave without pay are necessary to increase compliance with mandated vaccination. When employees have the option to opt out, they likely will.

Awali et al. (2014) explored factors influencing influenza vaccination rates among health care personnel and their attitudes toward a mandatory policy. In this descriptive correlational study, a 33-item web-based questionnaire was administered to 3,054 HCWs who worked in a Detroit hospital, yielding a 32% response rate. Of the participants, 75% were between 36 and 65 years old, 66% were non-White Hispanics, 86% were females, 33% were nurses, and 51% had been employed at the facility for more than 10 years. Findings of the study indicated an increase in the vaccination rate from 80% to 93% after implementing the mandatory policy ($p < .001$). The vaccination refusal rate was 4.8%. The main reasons cited for refusal were included side effects (63.5%), medical conditions (33%), and religious concerns (17%). Refusal rates were highest among African American HCWs compared to non-White Hispanic HCWs ($p < .001$) and among those with an associate's degree or lower education compared to those with a bachelor's degree or higher ($p < .004$). The web-based questionnaire used for this study demonstrated limitations based on a low response rate. The findings indicated that there was a gap in the literature related to the effects of mandating influenza vaccinations and assessing the benefits of vaccine-related educational programs. Awali et al.'s study related to the current project in that it

showed an increase in flu vaccination rates following the implementation of a mandatory policy. It also showed that health care personnel lack education on vaccine-related information. Hence, implementing comprehensive annual educational interventions on influenza prevention strategies could be beneficial in increasing vaccination rates and reducing refusal rates.

Many health care authorities worldwide strongly recommend influenza vaccinations for HCWs, but despite the recommendations vaccination rates are consistently low globally (Stathopoulou & Skourti, 2010). Increasing flu vaccination rates among HCWs would aid in reducing lost time from work and in protecting vulnerable patient populations from complications that could lead to increased morbidity and mortality. Stathopoulou and Skourti (2010) conducted a global study to identify factors that influence HCWs decision to participate in flu vaccination programs. The precede-proceed model is a comprehensive model to assess health care needs and to evaluate health promotion. The study aimed to classify the HCWs' decision to be vaccinated according to the *precede-proceed* model of health promotion planning and provide a summary of health promotion interventions that were shown to be helpful in increasing vaccination rates among HCWs. The precede-proceed model is an organizing framework that health educators can use to develop health promotion planning models to aid in increasing flu vaccination rates among HCWs. A meta-analysis was used to evaluate the data and an observational design was used for the study. Therefore, no statistical data were reported, which is a limitation of the study. The compilation of global data was a strength of this study as it indicates that low vaccination rates among HCWs are a problem worldwide. The findings revealed that HCWs worried about the transmission of influenza to relatives, the effectiveness of the vaccine, social stigmatisms, and accessibility of the vaccine. Concerns over potential side effects, mistrust in vaccine effectiveness, and perception of low susceptibility are reasons why HCWs refuse the vaccine. Stathopoulou and Skourti concluded that effective interventions

include utilization of both education and vaccine promotion campaigns that are convenient to employees to encourage participation. It also concluded that management buy in, free vaccines, and small incentives were also important for the campaign to succeed. There was a significant connection between Stathopoulou and Skourti's study and the current study, in that both were conducted to determine ways to increase employee vaccination rates. The use of an educational intervention to increase acceptance, knowledge of influenza transmission, and awareness are also parallel connections. Additionally, both studies provided education on the vaccine and vaccine side effects. The study's findings indicated that effective educational interventions can increase influenza vaccination rates.

Organizational Factors in Influenza Campaign

Razouki et al. (2016) conducted a qualitative study to evaluate organizational factors associated with HCW influenza campaigns in the veterans' health care system. Vaccination rates are low at many facilities within the VHA, which is known as the largest integrated health care system in the United States. The impetus for this study was to determine organizational factors and practices that yielded successful campaigns among six VHA facilities. Participation in the flu vaccination programs within the VA is voluntary, and employees receive the vaccine free of charge. A total of 31 telephone interviews were conducted with lead employees who facilitated HCW flu activities and vaccination campaigns at three facilities with high vaccination rates and three facilities with low vaccination rates. Constant comparisons were made between the organizations and management at all study sites by characterizing themes and analyzing the data. Results of the survey revealed three distinguishing factors among facilities with high vaccination rates:

1. Increased executive leadership buy in and valuable support, which promoted innovative ideas and necessary resources.

2. Enthusiastic influenza team member characteristics with increased collaboration between team members, team ownership and empowerment to meet team goals, and adequate time and staff to ensure campaign success.
3. The emergence of strong practices such as advanced plans, readily available vaccines, effective vaccine tracking mechanisms, electronic methods to educate HCWs, and using audits to target efforts unvaccinated employees.

The researchers concluded that successful HCW flu campaigns share similar characteristics that can be emulated to improve facility vaccination rates. This research is relevant to the purpose of this study because it was performed within VHA and discusses organizational issues that could influence flu vaccination rates. The study's findings also showed evidence of the low influenza vaccination rates throughout VHA and provided organizational strategies that could help to increase vaccination rates (Razouki et al., 2016).

The goal of a retrospective cohort study conducted by Van Buynder et al. (2015) was to assess the impact on absenteeism after implementation of a facility policy requiring HCWs to receive the influenza vaccine or wear a mask. Full-time HCWs who worked at the Fraser Health Authority (FHA) in Mainland British Columbia during the influenza season were included in the study. The study included 10,079 HCWs. Results indicated that during the first year of policy implementation, vaccination rates among staff employees increased from 31% to 77%, rising to 86% in the second year. Additionally, 77% of the employees were vaccinated during the first year, and 23% were unvaccinated. The mean rate for absenteeism due to illness was 5.16 and 6.26 for unvaccinated staff compared to a mean of 4.45 and 5.01 for vaccinated FHA staff.

Van Buynder et al. (2015) used descriptive statistics to compare vaccinated and unvaccinated HCWs. Chi-square or Fisher's exact test were used to analyze categorical variables *t* tests for continuous variables. The Wilcoxon ranked test was used to determine if the

sick rates were different between the two periods. Linear regression was used to identify differences absenteeism due to illness between seasons and to determine if there was a significant difference between vaccinated and unvaccinated HCWs. The linear regression construct allowed correction for differences in preceding absenteeism rates in both groups. Findings from this study indicated unvaccinated staff had increased absenteeism from illnesses compared to vaccinated staff. With the introduction of the policy, vaccination rates increased. The cost savings on absenteeism was over $1 million with the introduction of the new policy.

Ludwig-Beymer and Gerc (2002) conducted a study to address inadequate vaccination rates among employees of a large integrated health care organization with over 200 sites and 20,000 staff members in Chicago, Illinois. In this descriptive quantitative study, 990 participants agreed to participate voluntarily in the study by completing a mailed-out influenza questionnaire. The purpose of this study was twofold:

1. To get a better understanding of the impact the employee health portion of the initiative has on vaccination rates.
2. To determine factors that influence employee acceptance of the flu vaccine.

According to Ludwig-Beymer and Gerc (2002), many HCWs do not believe that flu is a big concern, and they feel that youth, as well as overall good health, will provide them with sufficient protection. The study also indicated that many refused the flu vaccine because they were confident that their bodies would fight infections and did not feel that the vaccine was effective. Ludwig-Beymer and Gerc contended that customized strategies to meet the needs of employees need to be implemented and should include the following components: education, access, free vaccines, and incentives. Results of the study indicated statistical differences in participants based on age ($p < .0001$), race/ethnicity ($p = .0257$), working environment ($p = .0019$), and recommending the vaccine to others ($p < .0001$). Additionally, 74% of

participants were White, 80% were female, and 61% were between the ages of 36 and 55. Seventy-eight percent of participants worked in the hospital, and 40% percent reported having direct patient contact. More importantly, most of the participants received the vaccine. Twenty-three percent of participants reported that they did not receive the vaccine, but in the past when they got the vaccine, they still got sick. Another 17% of participants did not believe the vaccine was effective, 14% indicated concerns about the safety of the vaccine, and 11% claimed they were healthy and did not need the vaccine. The study was relevant to the project of interest and validated a lack of education regarding influenza prevention among HCWs. Furthermore, it identified misconceptions about the safety and effectiveness of the vaccine. Findings indicated a need for comprehensive approaches to educating staff on influenza prevention.

Summary

Influenza is a highly contagious respiratory virus that can be prevented with influenza vaccination administration. Annually, many people die from a disease process that can be prevented. Unfortunately, unvaccinated HCWs contribute to the transmission of flu in various health care settings. Despite strong recommendations by various health care organizations, vaccination rates remain below the target Healthy People 2020 goal of 90% (U.S. Department of Health and Human Services, 2012). Review of the literature revealed a lack of research investigating a relationship between health-promoting practices accompanied by influenza education interventions and vaccination rates. Evaluating health-promoting practices and how they affect federal HCWs' willingness to be vaccinated against influenza and implementing educational interventions may help federal health care organizations improve influenza vaccination rates.

Chapter 3: Research Design

Influenza is a preventable communicable disease that can lead to death and epidemic outbreaks. It is especially deadly among vulnerable populations such as the very young and elderly. Despite the potentially lethal effects influenza can have, many federal HCWs who provide direct patient care are reluctant to get vaccinated. Although influenza vaccines are offered free of charge in federal health care facilities, many refuse the vaccine, putting themselves, their family members, and their patients at risk of contracting influenza.

The purpose of this project was to assess the efficacy of an educational intervention among HCWs who decline the flu vaccine; for this project, efficacy was measured based on participants' willingness to accept receipt of future flu vaccines. This project sought to answer the following question: Does willingness to accept the influenza vaccinations among federal HCWs (P) increase after receiving a 15-minute educational intervention (I) on prevention strategies and knowledge of influenza transmission during peak flu season over 2 months (T)? Hence, to study low influenza vaccination rates among federal HCWs, a one-group pretest-posttest design served as the blueprint. A one-group pretest-posttest design is a commonly used quasi-experimental design. Polit and Beck (2018) described quasi-experimental designs as a true experiment that lacks randomization and, in some instances, lacks a control group. Additionally, quasi-experimental designs are used in determining the effectiveness of interventions as well as whether the rigor of design is useful in providing compelling evidence to guide clinical practice (Melnyk & Fineout-Overhold, 2005).

For this study, no control group or comparison group was utilized. In a pretest-posttest design, the dependent variable is measured once before implementation of the treatment and once after the treatment. The one-group pretest-posttest design served as a within-subjects experiment where participants are tested before and after the intervention. In this study,

participants were observed at two time points, one before the treatment and one after the treatment. The posttest was administered immediately after the educational intervention in this study to avoid losing the participants for a follow-up evaluation, as many employees avoid the topic of influenza vaccinations because they are reluctant to receive the vaccine. Changes in the participants' willingness were presumed to be the result of the intervention. Using a one-group pretest-posttest design poses numerous threats to validity. Extreme caution should be used when interpreting and generalizing the results due to the lack of a control or comparison group. Changes that occur in a one-group pretest-posttest design could be the result of historical changes unrelated to the intervention or the participants' maturation. Limitations of this design include that it is less rigorous and lacks randomization or a control group (Polit & Beck, 2018).

The impetus of a research design is to provide a plan for conducting research that facilitates the achievement of the study's purpose and yields accurate findings. The goal of the quasi-experimental design is to show causal relationships, evaluate relationships, and provide clarification on why events happen (Polit & Beck, 2011). Moreover, to assess the phenomenon of low vaccination rates among federal HCWs, a pretest-posttest questionnaire was employed to assess willingness to receive/acceptance of future vaccines before the educational intervention and post intervention. Acceptance of the vaccine is a preventive measure that is considered a positive health-promoting practice. Willingness to receive or acceptance of the influenza vaccine was determined by participants' responses on the posttest questionnaire.

Methodology

IRB approval and process. Permission to conduct this study was obtained from the SLVHCS Internal Review Board (IRB). Data collection began after the proposal defense was approved and after receiving approval by the SLVHCS IRB as a performance improvement project (see Appendix A). Protection of human subjects was based on the criteria from the IRB

at SLVHCS. Research confidentiality was maintained as follows: No participant names were given. Survey tools only included the participants' first and last initials as well as a two-digit number. Consent forms and questionnaires were kept in a locked file cabinet in the principal investigator's office.

The influenza educational intervention was administered to HCWs who declined the flu vaccine for the 2018 season. Declination was determined based on employees not attending the annual mobile flu campaign event and the facility's emergency preparedness exercise designed for all employees to report to a designated area to determine vaccination status, sign a declination form if desired, or receive the flu vaccine. For this study, the Occupational Health Records System (OHRS) for the SLVHCS was utilized to identify unvaccinated HCWs. The principal investigator had been approved to access this database as the occupational health provider and system administrator. The OHRS system of records is a national database used to track and trend vaccination rates for federal employees. According to the OHRS, 274 nurses and nursing staff at the SLVHCS facility did not receive the flu vaccine during the 2017 season. Data from September 2018 through December revealed that 461 nurses and nursing staff were unvaccinated.

To ensure accuracy and to capture individuals who received the vaccine elsewhere, the investigator confirmed receipt of the vaccine elsewhere with employees on the unvaccinated list during the screening process. Hence, a cohort of this group was targeted for study participation. Subjects were asked to participate voluntarily by signing an informed consent form (see Appendix B). After the consent form was signed, participants completed a demographic profile (see Appendix C) and the influenza pretest questionnaire to determine individual knowledge of influenza prevention strategies and willingness to accept the vaccine before the intervention as well as reasons for declining the vaccine. Afterwards, the investigator presented a 15-minute

influenza educational intervention using PowerPoint that provided an overview of influenza transmission and prevention strategies for HCWs from the CDC. Lastly, participants completed the posttest questionnaire, which evaluated their willingness to receive the flu vaccine after the educational intervention (see Appendix D). The educational interventions were conducted in exam rooms, break rooms, and conference rooms. The following topics were discussed during the educational intervention:

- Introduction to my story and reason for selecting this topic
- Influenza vaccine information for health care workers
- The importance of getting vaccinated
- Number of health care workers vaccinated
- Number of health care workers vaccinated according to work settings
- Reasons health care workers refuse the vaccine
- Flu facts
- Vaccine facts
- Types of vaccines available
- Recommendations on who should take the vaccination
- Vaccine recommendations for people with certain conditions

Participants were given an oral and visual presentation. Over half of the presentations were given one-on-one, with the remainder conducted in small groups of 2 to 5 participants at the SLVHCS in the HCWs' designated work area. Participants were asked to complete a demographic profile (see Appendix C) and a six-item pretest questionnaire. Afterward, the investigator presented the educational intervention and participants completed the influenza posttest questionnaire. The posttest results were used to reevaluate willingness to receive or acceptance of the influenza vaccine after the educational intervention based on their previously

reported reasons for declinations. If subjects agreed to receive the vaccine, they were immediately referred to occupational health for vaccination administration as the data were collected during peak season.

Feasibility and appropriateness. Feasibility involved determining the cost of an evidenced-based project (Keele, 2011). To determine feasibility accurately, a cost analysis that included a budget for human resources, technology, personnel, and program expenses fees was completed. The total cost incurred to conduct the study was $850 (see Table 1). The majority of the expenses were for the purchase of an iPad tablet. The tablet was purchased for its portability and convenience as a visual aid to display the presentation. Additional expenses were for miscellaneous items, including paper, pens, clipboards, and an ink cartridge.

Table 1

Program Implementation Expenses/Budget

Item	Cost
Personal expenses	$760
Computer usage	$0
Miscellaneous supplies (pens, clipboards, paper)	$30
Ink cartridges	$60
Total	$850

Interprofessional collaboration. The project involved working with an interdisciplinary team on the Influenza Steering Committee. The interdisciplinary team included physicians, APRNs, RNs, LPNs, infection control, safety personnel, and environmental care staff. Members of this team strategized to develop a flu plan and annual flu campaign events. The principal investigator was a member of the team.

Setting. A 200-bed federal health care facility located in southeast Louisiana was selected for this project. The facility has over 2,500 employees. The educational intervention,

influenza pretest, and posttest were administered in several closed conference rooms on an electronic tablet (iPad) using a PowerPoint slideshow.

Target population and sampling plan. Participants were recruited via purposive sampling, which Polit and Beck (2018) described as a form of sampling utilized when the investigator has knowledge about the sample and handpicks participants. To recruit participants for the study, the investigator used a list of employees to identify individuals who did not receive the vaccine. Purposive sampling was the best method for this study because the OHRS database contained the names of all unvaccinated employees.

The projected sample size was determined by computing a power analysis to decrease the risk of committing type II errors and strengthen conclusion validity for estimating required sample size for this inquiry (Polit & Beck, 2011). The significance level was set at 0.05, which indicated the probability that the relationship's observed magnitude would find for α 2-tailed test. The power was set at 1-β yielding (0.8), which reflected the probability of detecting a true relationship. This researcher was unable to find any studies pertaining to the research topic as a reference, resulting in the selection of Cohen's method for the anticipated effect size of .05. The results of this power analysis generated a minimal sample size of 64 participants for the study.

Inclusion criteria for this project included nursing staff who (a) were above 18 years of age; (b) did not receive the influenza vaccine during the 2018 season; (c) were employed by a federal facility that provided direct patient care; and (d) were able to read, write, comprehend, and speak English. Individuals younger than age 18 and HCWs who were previously vaccinated were excluded from this study.

Risk and benefits. Minimal risk was associated with participating in this project. Human subjects' personal information was held in strict confidence, participants were deidentified, and no personal information was shared with hospital administrators. Information

obtained from this project was used to develop a comprehensive plan to increase HCWs' knowledge of influenza transmission and prevention, as well as enhance HCW receipt/acceptance of annual flu vaccination in an effort improve the facility's flu vaccination rates in accordance with the recommendations established by Healthy People 2020 (U.S. Department of Health and Human Services, 2012), The Joint Commission (2012), and VHA Directive 1192 (Department of Veterans Affairs, 2017).

Instrument and measurement tool. The instrument used in this study was an influenza questionnaire, an investigator-developed pretest-posttest instrument. The researcher designed it specifically for this study because she could not find an existing tool to evaluate the reasons why federal HCWs decline the influenza vaccine. As a result, reliability and validity testing had not been performed on the instrument. Therefore, use of the investigator's tool posed study limitations. However, content validity was established by three infection control experts, including an infection control physician and two certified infection control registered nurses, who evaluated the tool's content for relevance to the current study. Content validity is defined as "the extent to which an instrument's content adequately captures the construct—that is, whether a composite instrument has an appropriate sample or items for the construct being measured" (Polit & Beck, 2011, p. 176). The content validity index of the influenza pretest-posttest questionnaire determined by the expert panel was 1.0. According to Polit and Beck (2011), a score of .90 or higher represents evidence of useful content.

Studies conducted in field settings, like this one, have intrinsically greater ecological validity, or "the extent to which the tasks and manipulations of a study are similar to real-world contexts" (Morling, 2015, p. 549), than laboratory research. Even so, field research typically places constraints on the kinds of measures and research designs that are available to the researcher (Gravetter & Forzano, 2016). These constraints result in ambiguities in the

interpretation of study findings (i.e., threats to internal validity) as well as limitations in the ability to generalize findings to other individuals, measures, places, and times (i.e., threats to external validity). Threats to internal and external validity call for caution in interpreting findings and generalizing those findings beyond the sample that was examined.

The influenza questionnaire (pretest) was a six-item questionnaire that specifically addressed the reasons why HCWs decline the influenza vaccine and their willingness to accept the vaccine as a preventative health promoting practice. It evaluated HCWs' knowledge of Healthy People 2020 (U.S. Department of Health and Human Services, 2012) and The Joint Commission (2012) standards for health care facilities to have a 90% vaccination rate by 2020.

Additionally, the tool was used to evaluate federal HCWs' knowledge of VHA Directive 1192. Responses to the questionnaire were scored as follows: *yes* or *no*. Question 1, which asked, "Did you received the influenza vaccine during the 2018 flu season?" was not scored. However, the question was posed to provide insight into the reasons why individuals decline the vaccine. Question 1 was also used to determine if participants met inclusion criteria for the study. The posttest influenza questionnaire contained three questions from the pretest with the addition of one question for a total of four items. One of the additional questions asked, "Do you feel this information was helpful to you?" This item assessed if the information presented in the educational intervention was helpful to the participant. It was included to determine whether or not subjects found that the educational intervention increased their knowledge and awareness of influenza transmission, prevention, and vaccines. The last question asked, "Are you willing to receive the influenza vaccine?" evaluated participants' acceptance of the vaccine after the educational intervention.

Data collection. Subjects participated in this study voluntarily and were provided with a letter of information that summarized the purpose of the study. The instruments that the

investigator utilized for data collection included a demographic questionnaire and the influenza pretest-posttest questionnaire. The survey tool was coded for accuracy using the first and last initial and the two numerical digits of the participant's choice, thereby deidentifying each participant. Data from subjects were obtained as follows:

1. Upon arrival at the conference room, subjects who met the eligibility criteria were asked to participate in the study voluntarily and sign a written consent form.
2. Each participant received a copy of the influenza questionnaire (pretest) for completion.
3. After completion of the influenza questionnaire (pretest), a 15-minute educational intervention was presented that provided an overview on influenza using CDC data on influenza vaccination information for HCWs displayed in a PowerPoint presentation.
4. Following completion of the influenza pretest questionnaire, participants completed the influenza posttest questionnaire. The posttest was also used to reevaluate participants' willingness to receive or acceptance of the influenza vaccine after the educational intervention.
5. If subjects agreed to receive the vaccine, they were immediately referred to occupational health for vaccination administration. Furthermore, if employees declined the offer after the previous interventions, they were asked to review VHA Directive 1192, which requires unvaccinated employees to sign a declination and wear a mask during flu season in an effort to adhere to the facility's policy and the national directive.
6. After completion of study instruments, the researcher scored the tools for each participant.

Timeline. The timeline for the development of this program began in January 2017 at the beginning of the DNP program and was progressively expanded through January 2019. After IRB approval in October of 2019, data collection began and lasted for 2 months. It was initially planned to complete the data collection in 1 month. However, the facility is quite large, with more than 2,500 employees, creating limitations in the investigator's ability to recruit and locate participants. Participants were recruited in the outpatient primary care and mental health clinics, inpatient medical surgical unit, inpatient mental health, intensive care, community care rehabilitation unit, emergency room, endoscopy specialty care unit, and the surgical care unit. Data collection was conducted during the day, night, and evening shifts at various times due to logistical issues and the facility policy. Table 2 represents the occurrence of events.

Analysis plan. Statistical Package for the Social Sciences (SPSS) Version 25 was used to analyze the data. Descriptive statistics (frequency, mean, median) were used to describe demographic characteristics and items on the influenza questionnaire. McNemar's test is a nonparametric test that was used to measure the research question and determine differences in the following conditions:

1. Pretest and posttest influenza educational scores.
2. Pretest and posttest acceptance and declination rates of the influenza vaccine.

McNemar's test can be likened to a paired-samples *t* test, except that the *t* test utilizes a continuous dependent variable, whereas the McNemar test uses a dichotomously scored dependent variable (Sheskin, 2011). The fact that a dichotomous dependent variable is used in McNemar's test frees that statistical procedure from the sometimes-onerous statistical assumptions of the paired-samples *t* test (i.e., pretest-posttest difference scores must be normally distributed and without outliers; Tokunaga, 2019). In contrast, the nonparametric McNemar's test requires a single dichotomous dependent variable that provides binary data (such as *no* = 0,

Table 2

DNP Project Timeline

Month/year	Task toward project completion
January 2017	Acquired a doctorally prepared mentor and submitted the form
	Developed problem of interest for clinical inquiry
	Selected nursing theorist for problem of interest
February 2017	Developed PICO question
March 2017	Developed theoretical framework
	Searched the literature for related studies
April 2017	Finalized PICO question and finalized evidenced-based worksheet
May 2017	Developed research design
June 2017	Completed rough draft of the literature review
July 2017	Selected research chair and committee
August 2017	Submitted rough draft of Chapters 1–3 to chair
September–October 2017	Revisions to Chapters 1–3
January–February 2018	Continued revisions and development to chapters 1–3
March 2018	Completed Chapters 1–3
March–April 2018	Developed PowerPoint presentation for proposal defense
May–June 2018	Acquired an affiliation agreement
September 2018	Selected new chair
	Survey tool developed and content validity confirmed by experts
	Submitted Chapters 1–3 to committee; scheduled proposal defense
October 2018	Proposal defense completed and approved
	IRB approval obtained
	Developed recruitment plan and data collection began
December 2018	Data collection ended
	Data analysis began with entrance into Excel and SPSS
January 2019	Data analysis completed
	Submitted Chapters 1–5 for committee review

yes = 1) and a single within-subjects (i.e., repeated-measures) nominal scale independent variable with two levels (such as is provided by the pretest-posttest design; Sheskin, 2011).

The advantage of using a nonparametric test such is that data retain the original value. Another advantage of nonparametric data is that it simplifies data interpretation. In contrast, the disadvantage of using a nonparametric test is the inability to measure questions with multiple variables.

Summary

Influenza is a preventable communicable disease that in most cases can be eradicated with receipt of the influenza vaccine. The disease can be deadly among vulnerable populations, such as pediatric and geriatric populations, yet many federal HCWs elect not to receive the flu vaccine despite recommendations by the CDC and national standards set by Healthy People 2020 (U.S. Department of Health and Human Services, 2012) and The Joint Commission (2012). Many federal health care facilities fail to meet the 90% vaccination rate as a result of employees' unwillingness to be vaccinated. To evaluate low vaccination rates among federal HCWs, a quasi-experimental design served as the blueprint for conducting this study. Polit and Beck (2018) described quasi-experimental designs as true experiments that lack randomization and, in some instances, lack a control group. The statistical test used to evaluate this phenomenon was the *t* test and chi-square. These tests were used to assess the efficacy of an educational intervention among HCWs who decline the flu vaccine; efficacy was measured by willingness to receive/acceptance of the flu vaccine.

Finally, the influenza questionnaire was used to assess federal HCWs' willingness to accept future flu vaccines after an educational intervention. Demographic information was also obtained from participants to summarize their age, race, socioeconomic status, and education. Information obtained from this project will be used to develop a comprehensive plan to increase

HCWs' knowledge of influenza prevention strategies and willingness to accept future flu vaccines to improve the facility's flu vaccination rates in accordance with recommendations given by Healthy People 2020 (U.S. Department of Health and Human Services, 2012), The Joint Commission (2012), and VHA Directive 1192 (Department of Veterans Affairs, 2017).

Chapter 4: Results

The purpose of this study was to assess the efficacy of an educational intervention among federal HCWs who decline the flu vaccine; efficacy was measured by participants' willingness to receive/acceptance of future flu vaccines. The research question was, Do health-promoting practices affect federal HCWs' willingness to be vaccinated against influenza after receiving a 15-minute educational intervention on prevention strategies and knowledge of influenza transmission during future flu seasons?

Efficacy of the intervention was measured using participants' responses to three dichotomous (*yes* or *no*) questions measuring participants' knowledge of influenza vaccination recommendations and directives and willingness to receive a flu vaccination: (a) "Did you know that Healthy People 2020 and The Joint Commission recommend that health care facilities have a 90% influenza vaccination rate for HCWs by 2020?" (b) "Are you aware of VHA Directive 1192, which requires all VA employees to get the vaccine or wear a mask during flu season?" and (c) "Are you willing to receive the influenza vaccine this year?" These three questions served as the study's dependent variables that assessed participants' willingness to accept the vaccine. In a one-sample pretest-posttest research design, 64 federal HCWs who reported that they did not get vaccinated at the beginning of the 2018 influenza season completed a pretest survey that collected data on these outcome questions. Additionally, participants indicated whether or not they believed in getting the flu shot, reported their reasons for not being vaccinated, and provided demographic and professional information. The pretest assessment was followed immediately by a 15-minute educational intervention, which consisted of a PowerPoint presentation that provided an overview of influenza and the flu vaccine using information from the CDC. A posttest immediately followed the intervention, collecting posttest data on the three outcome questions listed previously and one additional question that assessed

participants' evaluative reactions to the intervention: "Do you feel this information was helpful to you?" Data were collected using printed surveys and were manually entered into a Microsoft Excel spreadsheet. The Excel file was imported to IBM SPSS, and all subsequent data manipulations and analyses were performed using IBM SPSS (Version 25.0) statistical software. This chapter reported the results of statistical analyses used to describe the sample's demographic profile and professional characteristics, participants' reasons for having been vaccinated against the flu, and changes from pretest to posttest on the dependent variables used to assess the efficacy of a brief educational intervention designed to enhance knowledge of and readiness to accept the influenza vaccination.

Data were collected in the form of string variables (e.g., *yes* or *no*, *male* or *female*). In order to facilitate subsequent statistical analyses, string variables were recoded and converted to numeric variables. Frequency distributions were generated for all variables to enable checking for out-of-range values; none were found. The data were also checked for missing values on the dependent variables. One participant at pretest and 2 participants at posttest responded "Maybe" when questioned about their willingness to receive a flu vaccination; all other participants responded either *no* or *yes*. As there were not enough of these *maybe* responses to support a meaningful analysis, *maybe* responses were treated as missing data in the analysis of the third dependent variable. There were no missing data on either of the other two dependent variables.

Demographic and Professional Characteristics of the Sample

Information about the demographic and professional characteristics of the sample was collected at pretest and are summarized in Table 3. Data on all demographic variables were collected using categories. The variables included gender, age, marital status, ethnicity, income, education, and occupations. The categorization of these continuous variables made it impossible

Table 3

Sample Demographic and Professional Characteristics

Variable	*f*	%
Gender		
Male	5	7.8%
Female	59	92.2%
Age		
25–34	14	21.9%
35–44	8	12.5%
45–55	26	42.26%
55–64	14	21.9%
65–74	1	1.6%
Marital status		
Divorced	10	15.6%
Married	28	43.8%
Separated	1	1.6%
Single	23	35.9%
Widowed	2	3.1%
Ethnicity		
Black	56	87.5%
Hispanic	2	3.1%
White	6	9.4%
Income[a]		
Less than $25,000	1	1.6%
$25,000–$34,999	5	7.8%
$35,000–$49,999	13	20.3%
$50,000–$74,999	6	9.4%
$75,000–$99,999	16	25.0%
$100,000–$149,999	13	20.3%
$150,000–$199,999	4	6.3%
$200,000 and above	5	7.8%
No response	1	1.6%
Education		
GED	1	1.6%
High school	9	14.1%
Vocational/technical	12	18.8%
Associate's degree	7	10.9%
Bachelor's degree	22	34.4%
Master's degree	13	20.3%
Occupation		
CRNA	3	4.7%
HT	3	4.7%
LPN	9	14.1%
NA	12	18.8%
NP	3	4.7%
RN	34	53.2%

[a]Income interval widths are unequal. With the exception of the lowest income range, income ranges become wider at higher incomes. This can give the impression that there are more high-income individuals than is the case. Percentages do not sum to 100% due to rounding error.

to know any given participants' actual age or income; only individuals' categorical memberships were available.

As a consequence, descriptive statistics like means and standard deviations could not be calculated. Those descriptive statistics require more precise knowledge of individuals' scores than is available from grouped distributions. Using the procedure described by Diekhoff (1996), however, the researcher estimated the sample's mean age as 46.38 years by assuming that every individual within a given age category fell exactly at the midpoint of the category. The standard deviation was similarly estimated at 10.97 years. It was not possible to use this procedure in estimating the other continuous demographic variable, income, because the highest income category, $200,000 and above, was open-ended and thus had no midpoint.

Educational training and occupations also varied. The majority of participants were registered nurses 34 (53.2%). Twenty participants (34.4%) had a bachelor's degree, and 13 (20.3%) had a master's degree. Only 1 (1.6%) participant had a general education degree.

Beliefs About the Flu Vaccination and Reasons for Not Getting Vaccinated

None of the 64 study participants received a flu vaccination at the time of the study. However, 30 participants (46.9%) reported that they believed in the efficacy of flu vaccination, with 34 (53.1%) stating that they did not believe in the vaccination. Only 12 participants (18.8%) reported having missed any days of work due to cold or flu-like symptoms. Distinct options were allowed to model the options on the facility's influenza declination form. Among these 12 individuals, the number of work days missed ranged from 1 to 14, with a median of 2.50 days (SD = 4.77).

Table 4 and Figure 2 summarize the reasons participants offered for having not received a flu vaccination. Percentages presented in Table 4 do not sum to 100% because participants were allowed to identify more than one reason for not being vaccinated. The "other reasons"

Table 4

Reasons Given by Federal Health Care Workers for Not Receiving an Influenza Vaccination

Reason	*f*	%
I do not like being stuck by a needle.	10	15.6%
I am afraid that the vaccine will give me the flu.	10	15.6%
I am afraid that the vaccine will make me feel bad.	14	21.9%
I think the vaccine has unknown/harmful ingredients.	15	23.4%
I am refusing for medical reasons.	6	9.4%
I am refusing for religious reasons.	1	1.6%
I am refusing for other reasons.	36	56.3%

Note. Percentages do not sum to 100% because participants were allowed to identify more than one reason for not being vaccinated.

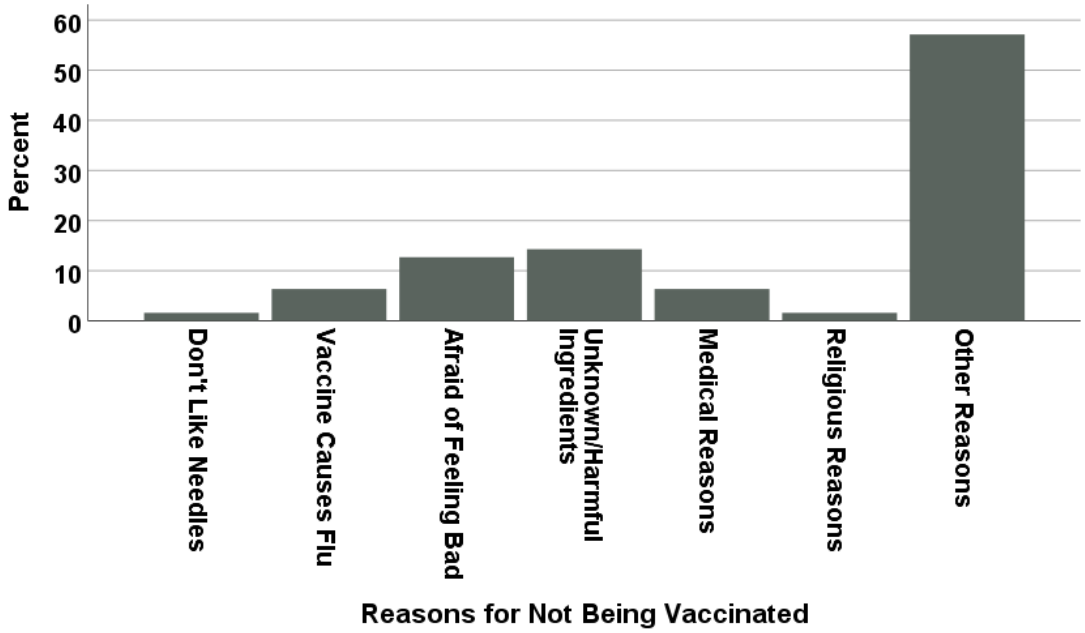

Figure 2. Reasons given by federal health care workers for not receiving an influenza vaccination.

response option was chosen frequently, with specific reasons varying widely. In many instances, participants selected this option, but their explanations appeared to fit one or more of the other, more specific categories. For instance, several individuals who identified "other reasons" for not being vaccinated explained that it was because they had medical conditions that precluded vaccination, had gotten sick following vaccination in previous years, or gave other explanations that were covered by the other response options. Very common were the explanations "I forgot" or "Haven't had time."

Efficacy of the Educational Intervention

Participants responded either *yes* or *no* to a set of three questions used during the pretest and posttest to evaluate knowledge of and willingness to accept an influenza vaccination. Intervention effectiveness was expected to produce increases from pretest to posttest in the percentages of positive (*yes*) responses and decreases in the percentages of negative (*no*) responses to these questions. Those pretest and posttest percentages are summarized in Table 5, along with the results of McNemar's tests of the significance of pretest-posttest changes in the percentages. McNemar's test can be likened to a paired-samples *t* test, except that the *t* test utilizes a continuous dependent variable, whereas McNemar's test uses a dichotomously scored dependent variable (Sheskin, 2011). The fact that a dichotomous dependent variable is used in McNemar's test frees that statistical procedure from the sometimes-onerous statistical assumptions of the paired-samples *t* test (i.e., pretest-posttest difference scores must be normally distributed and without outliers; Tokunaga, 2019). In contrast, the nonparametric McNemar's test requires a single dichotomous dependent variable that provides binary data (such as *no* = 0, *yes* = 1) and a single within-subjects (i.e., repeated-measures) nominal scale independent variable with two levels (such as is provided by the pretest-posttest design; Sheskin, 2011).

Table 5

Responses to Three Dichotomous (Yes or No) Measures of Knowledge of and Willingness to Accept Influenza Vaccination Before and After Exposure to an Educational Intervention

Outcome question	Response	Pretest		Posttest		McNemar's exact significance
		f	%	*f*	%	
1. Did you know that Healthy People 2020 and The Joint Commission recommended that health care facilities have a 90% influenza vaccination rate for HCWs by 2020?	No	29	45.3%	8	12.5%	$p < .0001$
	Yes	35	54.7%	56	87.5%	
	Total	64	100.0%	64	100.0%	
2. Are you aware of VHA Directive 1192, which requires all VA employees to get the vaccine or wear a mask during flu season?	No	7	10.9%	2	3.1%	$p = .063$
	Yes	57	89.1%	62	96.9%	
	Total	64	100.0%	64	100.0%	
3. Are you willing to receive the influenza vaccine this year?	No	32	52.5%	21	34.4%	$p = .001$
	Yes	29	47.5%	40	65.6%	
	Total	61	100.0%	61	100.0%	

Note. Three participants responded "Maybe" to the third outcome question, either at pretest or posttest, and were excluded from the analysis, leaving 61 cases for analysis. Analyses of responses to Questions 1 and 2 were supported by 64 cases.

Table 6 presents the data from these three analyses from a slightly different perspective, showing (a) how many participants who responded negatively at pretest remained negative at posttest, (b) how many participants who responded negatively at pretest changed their responses to positive at posttest, (c) how many participants who responded positively at pretest changed to a negative response at posttest, and (d) how many participants who responded positively at pretest remained positive at posttest.

Summary of the Influenza Pretest and Posttest Questionnaire

Participants showed significant improvements (i.e., shifts from negative to positive responses) on two of the three outcome questions examined in this study. During the pretest, 29 participants indicated that they did not know the Healthy People 2020 and The Joint Commission recommendations for health care facilities to have a 90% vaccination rate. A total of 35 participants indicated that they were aware of the of The Joint Commission standard and Healthy

Table 6

Summary of Positive and Negative Responses to Questions Regarding Knowledge of and Willingness to Accept Influenza Vaccination Before and After Exposure to an Educational Intervention

Outcome questions				
1. "Did you know that Healthy People 2020 and The Joint Commission recommended that health care facilities have a 90% influenza vaccination rate for HCWs by 2020?"		Posttest Response: No	Posttest Response: Yes	Rows
	Pretest Response: No	7 (24.1%)	22 (75.9%)	29
	Pretest Response: Yes	1 (2.9%)	34 (97.1%)	35
	Columns	8	56	
2. "Are you aware of VHA Directive 1192, which requires all VA employees to get the vaccine or wear a mask during flu season?"		Posttest Response: No	Posttest Response: Yes	Rows
	Pretest Response: No	2 (28.6%)	5 (71.4%)	7
	Pretest Response: Yes	0 (0.0%)	57 (100.0%)	57
	Columns	2	62	
3. "Are you willing to receive the influenza vaccine this year?"		Posttest Response: No	Posttest Response: Yes	Rows
	Pretest Response: No	21 (65.6%)	11 (34.4%)	32
	Pretest Response: Yes	0 (0.0%)	29 (100.0%)	29
	Columns	21	40	

Note. Percentages shown are row percentages.

People 2020 recommendations for health care workers. During the pre-test responses, 7 participants indicated that they were not aware of VHA Directive 1192, which requires health care workers to get vaccinated for influenza or wear a mask. In the posttest response, 57 participants validated that they were aware of Directive 1192. Pretest responses showed that 32 participants were not willing to receive the flu vaccine. Posttest responses indicated that 11 participants changed their mind after the educational intervention, and 29 participant responses remained the same. Findings of this study are further discussed in the following chapter.

Chapter 5: Discussion, Conclusion, and Recommendations

The primary purpose of this study was to assess the efficacy of an educational intervention among federal HCWs who decline the flu vaccine. Efficacy was measured by willingness to receive/acceptance of future flu vaccines. The research question was, Do health-promoting practices affect federal HCWs' willingness to be vaccinated against influenza after receiving a 15-minute educational intervention on prevention strategies and knowledge of influenza transmission during future flu seasons? Purposive sampling was used to recruit 64 participants in this study. All participants were federal HCWs who did not receive the influenza vaccine. Following the use of descriptive statistics such as means, standard deviations, and percentages of the sample, inferential procedures including *t* tests, chi-squares, and McNemar's test were used to answer the research question.

Interpretation of Findings and Discussion

Responses to Outcome Question 1: Did you know that Healthy People 2020 and The Joint Commission recommended that health care facilities have a 90% influenza vaccination rate for HCWs by 2020? The frequency of positive (*yes*) responses to the first outcome question increased significantly from 54.7% at pretest to 87.5% at posttest ($p < .001$). Of the 29 participants who responded negatively to this first outcome question at pretest, 22 (75.9%) changed their responses to a positive response following the educational intervention, and only 7 (24.1%) remained negative. Among the 35 participants who responded positively to the question at pretest, only 1 case (2.9%) switched to negative at posttest, and 34 (97.1%) remained positive.

Responses to Outcome Question 2: Are you aware of VHA Directive 1192, which requires all VA employees to get the vaccine or wear a mask during flu season? Awareness of VHA Directive 1192 regarding vaccination also increased, but only marginally, from 89.1% at

pretest to 96.9% at posttest. This was not a significant increase (p = .063), but awareness of Directive 1192 was already relatively high at pretest, creating a ceiling effect that left little room for improvement at posttest. Even so, that improvement was valuable, as it brought employee awareness of Directive 1192 to almost 100% following the educational intervention. Of the 7 participants who responded negatively to this second outcome question at pretest, 5 (71.4%) changed their responses to positive following the educational intervention, and only 2 (28.6%) remained negative. Among the 57 participants who responded positively to the question at pretest, no participants (0.0%) switched to negative at posttest, and 57 (100.0%) remained positive.

Responses to Outcome Question 3: Are you willing to receive the influenza vaccine this year? On the third outcome question, the percentage of unvaccinated federal HCWs who indicated they were willing to receive the influenza vaccine increased significantly (p = .001) from 47.5% at pretest to 65.6% at posttest. Of the 32 participants who responded negatively to this outcome question at pretest, 11 (34.4%) changed their responses to a positive response following the educational intervention, but 21 (65.6%) remained negative. Among the 29 participants who responded positively to the question at pretest, none (0.0%) switched to negative at posttest, and 29 (100.0%) remained positive.

Research question. Does willingness to accept the influenza vaccination among federal health care workers increase after receiving a 15-minute educational intervention on prevention strategies and knowledge on influenza transmission during future seasons? A single question was included in the posttest survey to measure participants' evaluative reaction to the intervention: "Do you feel this information was helpful to you?" All 64 study participants (100.0%) responded positively (*yes*) to this question.

Discussion

The research question in this study focused on the impact an educational intervention on influenza knowledge, awareness and preventive strategies would have on improving influenza vaccination rates among federal health care workers. Study data revealed a significant improvement in the number of participants who elected to receive the flu vaccine after the educational intervention. The need for frequent educational interventions became more apparent to the principal investigator, based on the number of questions asked by participants during the presentation. Surprisingly, many HCWs indicated that they learned information they did not know about influenza transmission and its effects on vulnerable populations as a result of the educational intervention. Many participants were candid about admitting to their lack of knowledge.

A significant number of health care workers were not aware of Healthy People 2020 and The Joint Commission standards for a 90% vaccination rate for health care facilities. After the educational intervention, a sizeable number of participants learned of this important recommendation. Additionally, many participants were aware of VHA Directive 1192, but unfortunately many of them did not adhere to the directive which requires unvaccinated staff to wear a mask when providing direct patient care.

Findings from this study also revealed distorted views on the reasons why health care workers refused the vaccine. Despite the educational intervention based on the CDC recommendations and the benefits of getting vaccinated, too many employees still declined the vaccine because of personal beliefs. Conversely, some health care workers have legitimate reasons for not receiving the flu vaccines such as allergic reactions, religion, and other health issues that prevent them from getting vaccinated.

Interestingly, several HCWs indicated on the pretest's optional reasons that they did not trust the government, which is why they chose not to receive the flu vaccine. Some participants stated that they refused the vaccine because they did not like the idea of being forced to get the vaccine. There was also a selected group who responded that they believe in practicing homeopathic medicine and refuse to put any unknown substance (e.g., flu vaccine) in their bodies.

Some positions taken by participants may be related to perceptions related to unethical research experiments such as the Tuskegee study. The Tuskegee study, which was conducted between 1932 and 1972, violated the principles of fair and ethical treatment during research. During the study, conducted by the U.S. Public Health Department (USPHD) to evaluate the progression of untreated syphilis, treatment was withheld from 399 Black men who were harmed or died as a result of the unethical practices by the principal investigators (Keele, 2011). This egregious study demolished the trust of human subjects and caused many people especially minorities to refrain from participating in clinical research and receiving vaccines. Brown, Lora, Anderson, and Sinsky (2014) reported that several Black men in Chicago believed the flu vaccine caused sterility and was designed to annihilate the African American community.

The irony is that even though health care workers vow to take care of others and may have formal education, their beliefs, values, and health promoting practices in many instances are that of non–health care workers. Based on the number of HCWs employed at the facility who refused the vaccine despite the educational intervention, vulnerable populations are at risk of contracting influenza. Unvaccinated staff pose a huge dilemma for health care facilities as it increases the risk of nosocomial infections thereby increasing the financial burden of care patients who are affected.

Summary of EBP Findings

Findings of this study showed that a 15-minute educational presentation about influenza and flu vaccinations was effective in enhancing knowledge about goals for influenza vaccination among federal HCWs and willingness of unvaccinated federal employees to receive a flu vaccination. Among the 64 unvaccinated federal HCWs who participated in this study, knowledge of the Healthy People 2020 (U.S. Department of Health and Human Services, 2012) and The Joint Commission (2012) goal of reaching a 90% vaccination rate by the year 2020 increased from 54.7% prior to the educational presentation to 87.5% following the presentation, and participants' willingness to receive the vaccination increased from 47.5% to 65.6%, both statistically significant improvements. Awareness of VHA Directive 1192 governing the receipt of vaccinations or wearing a mask during flu season was already quite high in this sample even before the educational presentation (89.1%), leaving little room for improvement, but nearly all study participants (96.9%) reported awareness of that directive following the presentation. All participants (100%) indicated that the educational intervention was valuable to them, thereby increasing HCWs' knowledge of influenza transmission and prevention.

Study Limitations

The efficacy of the educational intervention evaluated in this study was determined by collecting data both before the intervention and immediately following the intervention. Those immediate posttest measures supported the efficacy of the intervention. However, no follow-up measurements were taken to evaluate the persistence or staying power of the effect of the intervention. Several threats to the study's internal and external validity were identified. Those threats require that conclusions about the broad efficacy of the intervention be drawn with caution and constraint and point to the need for additional research.

Relationship to DNP Essentials

The Doctor of Nursing Practice (DNP) Essentials are the guiding principles for the doctorate of nursing practice. The impetus of the study was congruent with DNP Essentials I, II, and III. DNP Essential I addresses the scientific underpinning for practice, which focuses on the educational preparation and role of the DNP. The American Association of Colleges of Nursing (AACN) defined the role of an advanced practice nurse as developing

> any form of nursing intervention that influences healthcare outcomes for individuals or populations, including direct care of individual patients, management of care for individuals and populations, administration of nursing and healthcare organizations, and the development and implementation of health policy. (American Association of Colleges of Nursing [AACN], 2004, p. 2)

This study is congruent with the position statement of DNP Essential I, which has a benefit in promoting nursing knowledge as well as improving nursing practice and patient outcomes. This study was designed to improve knowledge and awareness of influenza transmission and prevention by increasing HCWs' vaccination rates, thereby reducing the risk of exposure and transmission of influenza to vulnerable populations to whom HCWs provide direct patient care.

DNP Essential II addresses organizational and systems leadership for quality improvement and systems thinking (AACN, 2004). The focus for the DNP graduate is on utilizing knowledge and skills to improve the quality of patient care and clinical outcomes for individual patients, populations, and the community. This essential is consistent with this study because it was a performance improvement project implemented to facilitate organizational change by improving the long-standing issue of low influenza vaccination rates among federal HCWs, which increases the risk of hospitalization and deaths for veterans. The researcher aimed

to improve patient outcomes for vulnerable patients, their families, and employees, which represents a cross section of the community.

Likewise, DNP Essential III speaks to the clinical scholarship and analytical methods for evidence-based practice for DNP graduates (AACN, 2004). The DNP graduate plays a pivotal role in translating research into practice through evidence-based practice, evaluating practice, participating in collaborative research, and disseminating findings for integration into practice. The investigator used the principles of scientific inquiry and evidence-based practice to guide this study, which demonstrates competency in the hallmark role of a DNP graduate.

DNP Essential IV focuses on the use of information technology for the improvement of patient care and the transformation of health care (AACN, 2014). DNP graduates are expected to be leaders in improving clinical outcomes and improve health care systems through the use of information technology, which is congruent with this study. The OHRS database was utilized to identify unvaccinated employees, thereby aiding the principal investigator in selecting the target population. Microsoft Excel was used to organize study data. SPSS Version 25.0 was used in analyzing the data and aiding in the development of study findings. Findings developed from the study were used to translate research into practice aimed to increase low influenza vaccination rates among federal health care works and aid the SLVHCS in developing a comprehensive plan to improve low influenza vaccination rates within the health care system.

DNP Essential V addresses DNP involvement in health care policy and advocacy in health care. DNP graduates are charged with designing, implementing and advocating for the health care policies that address health care disparity, access to health care, quality of care, and issues that pertain to health care equity and social justice in the delivery of health care (AACN, 2014). This study is parallel to health care policy and advocacy in that it was designed to increase influenza vaccinations rates among health care workers to protect vulnerable patients

and community. It also addresses the need for changes in the policy in federal health care systems in which there are no consequences for unvaccinated health care workers, which will be shared with facility leaders to implement organizational change.

Furthermore, DNP Essential VI speaks to interprofessional collaboration for improving patient and population health care outcomes (AACN, 2014). This study is aligned with the essential of interpersonal collaboration in that it aimed to improve health care practices with a goal to increase vaccination rates among health care workers. DNP graduates are expected to be leaders in facilitating collaborative teams in providing safe, timely, effective, efficient, equitable, and patient-centered cared in a complex environment (AACN, 2014). The principal investigator worked as a leader on the interdisciplinary flu team to strategize in developing a robust influenza plan for SLVHCS. Several experts on the interdisciplinary team also evaluated the pretest and posttest questionnaire for content validity.

DNP Essential VII refers to clinical prevention and population health for improving the nation's health (AACN, 2014). DNP graduates are expected to be change agents who focus on the prevention of disease for the population. This study is parallel to the essential in that it aimed to prevent the transmission of influenza to patients, employees, and the community by increasing awareness and knowledge of its transmission. This study is also congruent with the DNP essential in that as an APRN the principle investigator focused on disease prevention and health care promotion through ongoing advocacy to promote the importance of getting vaccinated against influenza.

Lastly, DNP Essential VIII speaks to the competency of the advance practice nurse and the expectation provide expertise in various specialty areas. The principal investigator's expertise in occupational medicine, disease prevention, and health care maintenance played a pivotal role in identifying the impact of low influenza vaccination rates among health care

workers. It is congruent with the DNP essential in that a SWOT analysis was conducted to assess facilities' strengths, weaknesses, opportunities, and threats that contributed to low influenza vaccination rates. The principal investigator used data acquired from the SWOT analysis as a guide for this study, which is consistent with the DNP Essentials.

Implications of Analysis for Leaders

Although knowledge and awareness of influenza transmission and prevention strategies increased among the HCWs in this study, too many HCWs remain unvaccinated. Unvaccinated employees increase the risk of transmitting influenza to vulnerable patients, which increases the risk of hospitalization as well as places a financial burden on the health care system. Despite facility policies and The Joint Commission (2012) and Healthy People 2020 (U.S. Department of Health and Human Services, 2012) recommendations, a sizeable number of unvaccinated employees still refused the vaccine (n = 21; 65.6%). These findings indicated the need for strict consequences to increase adherence to the facility's policy and minimize the transmission of influenza to veterans and employees alike.

To significantly impact influenza vaccination rates, facility leaders must implement a comprehensive influenza plan that includes an interactive interdisciplinary team. The plan should require employees to complete biannual recurrent educational training in the facility's web-based training program. The enforcement of consequences must also be implemented for employees who refuse the vaccine and do not comply with wearing a mask and signing a declination form. The only exceptions should be documented medical contraindications.

Recommendations for Future Research

There is a paucity in the literature evaluating the reasons why federal HCWs refuse the flu vaccine. The number of studies that evaluate the effects of an educational intervention on improving influenza vaccination rates is also limited. This study's findings validated the need

for recurrent annual educational interventions on influenza transmission and prevention strategies. There is also a needed for educational interventions designed to increase knowledge of and willingness to receive an influenza vaccination that has effects that extend 1 week, 1 month, or even years following the intervention. The investigator of this project plans to disseminate the findings at the VHA Research Day virtual poster presentation event scheduled for February 2019 and SLVHCS nurses' week poster presentation, as well as to publish the study in the *Federal Practitioner Journal*.

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Appendix A: IRB Approval Letter

Department of Veterans Affairs

Memorandum

Date: September 4, 2018

From: Chair, Southeast Louisiana Veterans Health Care System (SLVHCS) Institutional Review Board (IRB)

Subj: The Efficacy of an Educational Intervention to Improve Influenza Among Federal Healthcare Workers

To: Cynthia Berfect, APRN, MS, BC, FNP
Joan Mitchell, APRN, PhD, BC, FNP

1. The request for a Preliminary Review of your above-referenced New Project has been reviewed by the SLVHCS IRB Chair and SLVHCS Associate Chief of Staff for Research.

2. The activities described in your summary do not constitute research as defined in 38CFR16.102(d):

> *"Research means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge."*

3. **Please note** that data collection must be compliant with Veterans Health Administration (VHA) Privacy and Information Security policies. Questions pertaining to those requirements should be directed to the local Privacy Officer.

4. No further action is needed at this time. However, please note that if any changes are made to this project, these changes should be resubmitted to the SLVHCS IRB for review.

5. Any publications produced as a result of this project must be forwarded to the SLVHCS Public Relations Office for review prior to submission.

6. If you should have any questions, please contact the SLVHCS IRB Administration Office at [redacted]

Vecihi Batuman, MD

Appendix B: Consent Form

Consent Form

Study Title: The Efficacy of an Educational Intervention to Improve Seasonal Influenza Vaccination Rates Among Federal Health Care Workers

Dear Nursing Staff Member,

My name is Cynthia Berfect-Shelby. I am a doctoral nursing student at Abilene Christian University conducting a study to evaluate low influenza vaccination rates among Federal healthcare workers.

The purpose of this project is to assess the efficacy of an educational intervention among Federal healthcare workers who decline the flu vaccine in which efficacy is measured by willingness or acceptance of future flu vaccines.

Participation in this study will take 20 minutes of your time. It will require completion of a brief questionnaire and listening to a 15-minute educational presentation on influenza. Honesty is required for participation in this study.

Your participation in this study is voluntary and will not require you to provide any identifying information. You are not obligated to participate in this study. You can withdraw at any time. No compensation or benefits will be provided for participation in this study. To maintain confidentiality, your name will not appear in this study, and you will not be identified as a participant. The principal investigator will collect all data and stored it in a locked file cabinet. There are minimal risk and no harmful procedures. This study is beneficial, in that, it will be used to develop a comprehensive plan to increase HCWs knowledge of influenza transmission, prevention, and HCW receipt/acceptance annual flu vaccination in an effort improve the facilities flu vaccination rates. I would greatly appreciate your participation. Please sign this form if you voluntarily agree to participate in this study. Sign only after you have read all the information provided, and your questions have been answered to your satisfaction. You should receive a copy of this signed consent form. You do not waive any legal rights by signing this form.

_____	_____	
Printed Name of Participant	Signature of Participant	Date
_____	_____	
Printed Name of Person Obtaining Consent	Signature of Person Obtaining Consent	Date

If there are questions regarding this study, please contact me at:
Veterans' Health Care System
[redacted]

Appendix C: Demographic Profile

Occupation:

_____RN_____NP_____CRNA_____LPN_____CNA/Health Tech

Unit_____

Highest Level of Education Completed:

_____High School Diploma _____Technical/Vocational training

_____ Associate's Degree _____Bachelor's Degree

_____Master's Degree _____Doctoral Degree

Gender: Male_____ Female _____

Age:

_____18–24 years old_____25–34 years old_____35–44 years old____45–54 years old

_____55–64 years old_____65–74 years old_____75 years or older

Ethnicity origin (or race): Please specify (circle)your ethnicity:

White Hispanic or Latino Black or African American Native American or American Indian

Asian / Pacific Islander Other:

Marital Status: What is your marital status?

____Single, never married____Married or domestic partnership

____Widowed____Divorced____Separated

What was your total household income before taxes during the past 12 months?

_____Less than $25,000 _____$25,000 to $34,999

_____$35,000 to $49,999 _____$50,000 to $74,999

_____$75,000 to $99,999 _____$100,000 to $149,999

_____$150,000 to $199,999 _____$200,000 or more

Have you missed any days from work for cold or flu-like symptoms? Yes No

If so, how many days: _____

Appendix D: Pretest-Posttest Questionnaire

Influenza Questionnaire (Pretest)

Number_____ Date_____

1. Did you received the influenza vaccine during the 2018 flu season? Yes No

If so, did you receive it at SLVHC or elsewhere (indicate where)? _____.

If so, stop here.

2. Do you believe in getting the flu shot? Yes No

3. If you did not receive the vaccine, what are your reasons for not getting vaccinated?

_____I do not like getting stuck by a needle.

_____I am afraid that the vaccine will give me the flu.

_____I am afraid that the vaccine will make me feel bad.

_____I think the vaccine has unknown/harmful ingredients. I don't know what's in it.

_____I am refusing for medical reasons.

_____I am refusing for religious reasons.

_____I am refusing for other reasons. Please specify: _____

4. Did you know that Healthy People 2020 and the Joint Commission recommend that health care facilities have a 90% influenza vaccination rate for HCWs by 2020? Yes No

5. Are you aware of VHA Directive 1192, which requires all VA employees to get the vaccine or wear a mask during flu season? Yes No

6. Are you willing to receive the influenza vaccine? Yes No

Number_____ Date_____

Influenza Questionnaire (Posttest)

1. Did you know that Healthy People 2020 and The Joint Commission recommend that health care facilities have a 90% influenza vaccination rate for HCWs by 2020? Yes No

2. Are you aware of VHA Directive 1192, which requires all VA employees to get the vaccine or wear a mask during flu season? Yes No

3. Do you feel this information was helpful to you? Yes No

4. Are you willing to receive the influenza vaccine this year? Yes No

Appendix E: Curriculum Vitae

EXPERIENCE

SOUTHEAST LOUISIANA VETERANS HEALTH CARE SYSTEM
New Orleans, LA

Compensation and Pension, Acting Chief – 40hrs/week – 1/22/19-present

Provide programmatic leadership in overseeing clinical and administrative clinical operations. Supervise staff and fee-based physicians and nurse practitioners. Ensures that providers comply with the Office of Disability and Medical Assessment Policies and Procedures. Review all VBA claims for appropriateness and correct errors. Order and interpret test for all clinic providers. Ensure patient safety by addressing all abnormalities with the patient and/or examining provider. Certify time cards, write proficiencies, and physician evaluations. Counsel staff to ensure that facility standards are met in customer service and quality care.

Employee Health Nurse Practitioner- 40hrs/wk. - 02/2010 to 01/22/19

Served as the sole Occupational Health Provider and program coordinator for the past 7 years. Provided programmatic leadership in overseeing the daily administrative and clinical operations of the clinic according to OSHA standards.

Conducted over 80% of new employment physicals for the new facility in a timely manner to facilitate the facilities mission in onboarding staff for the new facility. Led and supervised four staff members. Conducted training and developed programs to provide clinical guidance to staff physicians and ancillary staff. Collaborate with facility leaders and interdisciplinary teams in strategic planning for Occupational Health (OH) improvement projects. Forecasted the need for additional staffing as well as changes in clinical practice to streamline procedures and facilitate cost savings. Manages the care of over 2000 employees by promoting wellness and providing evaluations for pre-employment physicals, illness visits, work-related injuries, and occupational exposures. Perform physical exams for facility Commercial Drivers as Federal Motor Carrier Safety Administration Certified Medical Examiner. Mission focused leader who understands and works to fulfill the organization's mission.

Care Coordination Home Telehealth, Lead Coordinator- 40hrs/wk. - 08/2006 to 04/2010
Provided programmatic leadership for the home telehealth program by managing clinical and administrative oversight of the program. Led and supervised a team of nurses and ancillary staff. Managed the care of high-risk Veteran patients with uncontrolled DM, HTN, CHF, and depression using telehealth technology to bridge the gap in care, increase access to care, decrease utilization, hospital admissions, and improve clinical outcomes. Collaborated with Interdisciplinary teams and Program Leaders throughout VHA. Trained coordinators throughout VHA and provided virtual coverage for coordinators at other facilities as a Master Preceptor. Developed an Emergency Preparedness plan for telehealth that was implemented throughout VHA. Ensured that program data was accurately and systematically analyzed, documented, and reported to Upper Management in an effort to meet facility performance measures and evaluate clinical outcomes.

Nurse Practitioner - Ambulatory Primary Care 40hrs/wk. - 07/2000 to 01/2006

Served as a Primary Care Provider for a panel of over 600 patients. Provided primary and episodic care to adult and geriatric patients with a focus on disease prevention and health care maintenance. Provided high quality, safe, effective, patient-centered care to Veterans with diseases processes such as DM, HTN, CHF, Obesity and a multitude of other disease processes. Committed to

increasing Veteran access to care. Managed a high-risk diabetes primary care clinic and diabetic foot clinic. Provided cross coverage for infectious disease, occupational health, women's health, and compensation and pension. Conducted a weekly Compensation and Pension ABI Clinic. Collaborated with Interdisciplinary teams to facilitate patient care and improve clinical outcomes.

VA MEDICAL CENTER-NEW ORLEANS
New Orleans, LA

Staff Nurse Registered Nurse/SICU/MICU/CCU 40hrs/wk. - 08/1993 to 07/2000

Managed Critical Patients with Multisystem Organ Failure, post-surgery, and cardiovascular diseases. Managed patients on vasoactive drips, intra-aortic balloon pumps, Swan Ganz catheters, dialysis, and other treatment modalities to maintain hemodynamic stability. Provided post-operative and pre and post - procedural care. Served as charge nurse and preceptor.

MEDICAL CENTER OF LOUISIANA AT NEW ORLEANS (CHARITY HOSPITAL)
New Orleans, LA

Staff Nurse Registered Nurse/ Medical Intensive Care 40hrs/wk. - 07/1992 to 07/1993
Cared for Critical Patients with Multisystem Organ Failure. Managed patients on vasoactive drips, intra-aortic balloon pumps, Swan Ganz catheters, dialysis and other modalities to maintain hemodynamic stability. Delivered high-quality care and compassionate treatment to indigent and low-income patients in the community. Actively participated in unit-based Quality Assurance Program. Served as a disciplined, energetic employee who quickly establishes favorable rapport with patients and colleagues.

EDUCATION AND TRAINING

CURRENTLY ENROLLED: DOCTOR OF NURSING PRACTICE - EXECUTIVE LEADERSHIP – Graduation Candidate – May 2019
Abilene Christian University Admissions, Abilene, TX, United States
Currently pursuing an advanced degree in the Doctor of Nursing Practice program with a role in Executive Leadership

MASTER OF SCIENCE: FAMILY HEALTH NURSING 1999
Southern University and A&M College, Baton Rouge, LA, United States
Dual Role Family Health Nursing and Education

BACHELOR OF SCIENCE IN NURSING 1992
Dillard University, New Orleans, LA, United States

CLINICAL RESEARCH COORDINATOR TRAINING
Dillard University, New Orleans, LA, United States
Completed a sixteen-week training as a Clinical Research Coordinator designed to promote minorities to participate in
clinical research trials according to NIH and ACA standards.

CERTIFICATIONS

Board Certified Family Nurse Practitioner – American Nurses Credentialing Center

Louisiana State Board of Nursing - Advanced Practice Nurse with Prescriptive Authority

Federal Motor Carrier Safety Administration - National Registry of Certified Medical Examiner for Commercial Driver's License

Master Preceptor Home Telehealth: Master Preceptor for the Care Coordinator Home Telehealth (CCHT); Developed a Disaster Management Protocol that was adopted by CCHT throughout VHA

RESEARCH SKILLS

Proficient in Statistical Package for the Social Sciences (SPSS) Proficient in developing and Conducting Research

Proficient in Critiquing the Research process

Serves as Co-Chair of the Research Committee; Responsibilities include guiding nurses through the research process and evidence-based practice.

HONORS

Inducted in Alpha Chi National College Honor Society – 12/2018 Received Outstanding Proficiency Evaluations for> 7 consecutive years Recipient of Special Performance for Advancement

Recipient of the Lettie Pate Nursing Scholarship

Recipient of the UNCF Scholarship for Academic Achievement Inducted in Sigma Theta Tau Honor Society of Nursing

AFFILIATIONS

American Academy of Nurse Practitioners (AANP) American Academy of Nurse Practitioners American Nurses Association

NOVA - New Orleans Chapter

Sigma Theta Tau Honor Society of Nursing

Alpha Chi National College Honor Society

TEACHING

Guest Lecturer at Dillard University (2017) - Lectured on Current Trend in Clinical Trials Acuity. The presentation was developed to address the knowledge gap in determining appropriate nurse-patient ratios during clinical trials based on acuity. Acuity-based staffing methods were discussed and compared for implementation in nurse staffing methodologies during clinical trials.

Guest Lecturer at Loyola University (1996) - Lectured on diseases that affect the male Genitourinary System to graduate students in the Adult Health Nurse Practitioner Program

Completed Student Education Practicum at Dillard University in the undergraduate nursing program (1998) - Lectured on the Cardiovascular System; Conducted clinical rotations with student nurses

RESEARCH

Thesis: Health Promoting Practices and the Efficacy of An Educational Intervention on Prostate Cancer Screening Rates Among African American Men

CONFERENCE PRESENTATIONS

Poster Presentation at VAMC's Nursing Research Convention in Biloxi, MS May 2000 on The Efficacy of an Educational Intervention in Improving Clinical Outcomes for Veterans with Cardiovascular Disease

CAPSTONE DISSERTATION PROJECT

Efficacy of an Educational Intervention to Improve Low Influenza Vaccination Rates Among Federal Health Care Workers

Appendix F: Permission to Use Figure 1

Permissions
4th Floor, Auto Atlantic
Corner, Hertzog Boulevard &
Heerengracht
Cape Town, 8001
South Africa
[redacted]

Apr 2, 2019 PE Ref # 208495

Cynthia Berfect-Shelby
ABILENE CHRISTIAN UNIVERSITY
1600 Campus Ct.
Abilene, TX 79601

Dear Cynthia Berfect-Shelby,

You have our permission to include content from our text, ***HEALTH PROMOTION IN NURSING PRACTICE, 7th Ed. by PENDER, NOLA J.; MURDAUGH, CAROLYN L.; PARSONS, MARY ANN,*** in your dissertation or masters thesis at Abilene Christian University.

Content to be included is:
35 Figure 2-3 "Health Promotion Model (Revised)"

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Sincerely,
Michael Prince,
Permissions Granting Analyst